

Pipe Jewelry Enables Longer Laterals

By Colter Cookson

As operators drill ever-longer laterals to increase recoveries, running casing has become more difficult. The longer the lateral, the more drag and friction frustrate efforts to push the casing to target depth. Since the majority of today’s resource play laterals rely on cased hole completions to optimize wellbore integrity and the success of multistage fracturing operations, operators are on a constant quest to prevent downhole problems when running casing.

Solid Body Centralizer

Volant Products Inc. offers a rigid body centralizer it says is capable of withstanding the rigors of the roughest casing-running and casing-drilling activities. “Our product is made from a steel tube that is hydroformed into a specific shape designed to allow the pipe to bear against the wall while keeping it centralized,” says company President Dan Shute.

The centralizer starts life as a steel tube. To shape it, the company uses water pressure and dies that are machined into a specific rib shape, usually a spiral. Shute points out that this process requires no welds, which improves the centralizer’s structural integrity and ruggedness. “There are no sharp edges to catch on ledges, so it is easy to guide the pipe through tortuous paths,” he adds.

Since their introduction almost 10 years ago, the centralizers have been deployed extensively in U.S. shale plays, Shute says. “They have a great track

record,” he reports. “In fact, we are unaware of a single mechanical failure where a centralizer has come off the pipe or been deformed to the extent it cannot centralize.”

When selecting centralizers, Shute advises looking beyond reducing friction. “Friction is only part of the picture. It is probably more important to recognize that minimizing side load is a key factor in achieving successful casing runs,” he says.

Centralizer Placement

Getting the most from good centralizers

requires well designers to position them judiciously, Shute says. To explain why, he points out that centralizers help casing get through the lateral by stiffening it so it can be pushed without inducing helical buckling.

“Imagine standing a thin steel ruler on a desk and pushing down on the top,” he says. “You can push hard, but eventually, the ruler will buckle and go into an arched shape. But if you support the middle of the ruler with two fingers, it will take a much greater force for the ruler to buckle.”

Rigid centralizers perform the same



Centralizer spacing is critical to maximizing efficiency and the chance of success when running casing. To help operators optimize their spacing, centralizer manufacturers such as Volant Products Inc. are developing programs that use sophisticated models to identify the best designs.



function when running casing in laterals, Shute says. However, he emphasizes that applying larger forces to a casing or liner must be managed safely with respect to inherent mechanical and structural limits.

Shute says, "From the borehole and casing system dimensions, it is possible to predict when and where buckling will happen, and also the wavelength of any buckle that might form. Using that information, we can recommend the optimum centralizer spacing to minimize the side loads that might otherwise result from helical buckling, which significantly reduces the forces required to run the casing."

Recommended centralizer spacing will vary across the wellbore, Shute notes. "When the compression is not as great and when the pipe is in the horizontal section, where it is inherently stable, the spacing can be increased. But in curved sections of the well, spacing needs to be tight."

Adding too many centralizers can be



counterproductive, Shute warns. "If the centralizers are too close together and tortuosity causes the leading one to jog right while the trailing one jogs left, the pipe will need to deform. This increases the side load on the pipe. Drag is a product of friction and side load, so it also will increase drag," he explains.

To enable optimum centralizer placement, Volant uses software it has developed to model the wellbore geometry, the structural and mechanical characteristics of the casing string, centralizer placement, and centralizer interaction with the wellbore. "Most centralizer placement programs account for the well geometry and pipe information, ask the user where he wants to put centralizers, and explain the consequences of that decision," Shute says. "Our software determines the optimum placement, which is a step change enabling operators to run the right number of centralizers, positioned correctly to achieve their objectives." □